**Chemistry 313 – 2015 Midterm Review Topics and Practice Problem Set**

***Exam Content***

* *Your exam will consist of 65 objective questions (a mixture of multiple choice, True/False, and Matching) and a problem set worth 30 points.*
* *Your in-class review work will be worth 20 points toward your midterm exam score. Your review packet will be reviewed daily for accuracy and completion. You will only be awarded points toward your midterm-grade for* ***completed****,* ***accurate*** *work.*
* *The most points that you can get on the exam is 115, however, you only need 100 points to get a perfect score.*

***Chapter 1: Chemistry: The Science of Matter***

* Classify matter as either a substance (elements and compounds) or a mixture (homogeneous and heterogeneous).
* Describe techniques that can be used to separate mixtures (crystallization, distillation and filtration)
* Identify physical and chemical properties of matter.
* Distinguish between physical and chemical changes in matter.
* Apply the Law of Conservation of Mass to chemical change.
* Interpret chemical formulas
* Identify and describe the 3 states of matter (solid, liquid, and gas).
* Calculate density, mass or volume given the appropriate data.

***Math Unit*** *(not in book. Refer to the Powerpoint and math booklet*)

* Convert between metric units (milli- to kilo-)
* Demonstrate the factor label method of conversion (dimensional analysis)
* Express numbers in scientific notation
* Perform calculations on numbers that are expressed in scientific notation

***Chapter 2: Matter is Made of Atoms***

* Relate historic experiments (Thomson and Rutherford) to the development of the atom.
* Describe Dalton’s, Thomson’s and Rutherford’s model of the atom to the current model.
* Interpret the information provided for each element on the periodic table.
* Calculate the atomic mass of an element given mass and abundance data.
* Describe the arrangement of electrons within atoms in terms of energy level, sublevel and orbital.
* Write the electron configuration for any element (1-56).
* Determine the number of valence electrons for an atom given the electron configuration
* Draw the Lewis Dot Structure for an atom.
* Describe the electromagnetic spectrum
* Compare and contrast a continuous spectrum with a bright line spectrum
* Identify wave characteristics (not in book, refer to notes).
* Calculate wavelength, frequency and energy given the appropriate data (not in book, refer to notes).

***Chapter 3: Introduction to the Periodic Table***

* Discuss the historical development of the periodic to include Dobereiner, Newlands, Mendeleev and Moseley.
* Predict the chemical and physical properties of elements by their position in the periodic table.
* Classify elements as metals, non-metals, or metalloids.
* Identify the properties of metals, non-metals, or metalloids.
* Classify elements by their chemical families: alkali metals, alkaline earth metals, halogens, noble gases, non-metals, metalloids, other metals, transition and inner transition metals.
* Describe the periodic trends of atomic size and electronegativity (not in book, refer to notes)

***Chapter 4: Formation of Compounds***

* Describe the properties of compounds in comparison to their constituent elements.
* Contrast the composition and properties of ionic and covalent compounds.
* Name ionic compounds given their chemical formulas
* Determine the chemical formulas of a variety of ionic compounds given their names.